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Experts in the Art & Science of Pharmaceutical Compounding

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A Comparison between Oral and Transdermal Hormone Therapy

Points/Quotes from Articles

1. The hormones used in hormone therapy can be delivered by a variety of methods, most often by the oral or transdermal route.[5]
2. Oral estrogens undergo first-pass metabolism through the liver, whereas transdermal estrogens do not. As a result, therapeutic plasma concentrations are achieved in a steadier, smoother fashion with transdermal estrogen, and blood levels are less subject to inter-individual variability. In addition, the lack of first-pass metabolism with transdermal estrogen allows the use of lower doses than with oral formulations, thereby reducing the risk of adverse effects.[5]
3. The route of administration may be an important consideration in minimizing the adverse effects of estrogen therapy on cardiovascular outcomes.[1]
4. Transdermal E2 had no effect on CRP or IGF-1 levels. In contrast, oral conjugated estrogens caused a more than two-fold increase in CRP and a significant reduction in IGF-1. CRP is the strongest independent predictor of myocardial infarction and cardiovascular mortality in apparently healthy women.[1]
5. Oral, but not transdermal, estrogen therapy increased CRP by a first hepatic effect. An increase in CRP levels is accompanied by a reduction in IGF-1, an anti-inflammatory group factor.[1]
6. Oral, but not transdermal, estrogen-replacement therapy is associated with risk of venous thromboembolism. Data suggests that transdermal ERT might be safer than oral ERT with respect to thrombotic risk.[2]
7. Oral estrogens undergo intestinal and hepatic first-pass effects. Oral estrogen administration also leads to high hormone concentrations in the liver and promotes hepatic protein synthesis.[2]
8. Transdermal HRT was associated with several favorable effects on cardiovascular risk factors in postmenopausal women, including reduction in serum triglycerides, elevation of HDL-2 cholesterol, and a more neutral effect on hs-CRP levels. In contrast, therapy given with oral combination was associated with a significant decrease in serum LDL cholesterol and a significant increase in hs-CRP but no change in serum triglyceride levels.[4]
9. Data for the pharmacokinetics of oral and transdermal estradiol showed dose-dependent increase in serum estradiol exposure. However, oral ERT results in a substantial increase in plasma estrone concentration leading to non-physiological ratio of estrone to estradiol close to 5. In contrast, transdermal ERT leads to plasma estrone to estradiol ratios close to 1, which is similar to that in menstruating women.[2]
10. Breast cancer risk appears to vary with different HRT formulations, different modes of delivery, the agents, and the length of use.[3]
11. Opposed estrogens (progesterone-estrogen) in oral form are associated with an increased risk of breast cancer, which increases with use. Transdermal opposed estrogens and unopposed estrogens do not increase this risk. The results are possibly due to differences in the pharmacokinetics and pharmacodynamics between these two formulations.[3]
12. Transdermal delivery provides a low constant level of hormone in the blood, and avoids hepatic protein synthesis stimulation. In contrast, oral delivery of estrogens causes levels to peak following gastric absorption after which there is a trough prior to the next dose.[3]

References

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